Reflections on the Impact of Scientific and Technological Innovation on the Future of Publishing: A Postprint

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Date: 2023-10-08T00:00:00+00:00

Abstract

【Objective】 To demonstrate the significant impact that technological innovation development will have on future publishing.

【Method】Through eight aspects—including reader reading interests and demands, the importance of publishing institutions, publishing models and processes, unified linkage of intellectual property rights such as publishing copyrights and commercial patents, protection of creative achievements during the submission stage, retraction mechanisms, job requirements for editorial and publishing personnel, and digital publishing copyright risks and challenges—combined with examples for demonstration.

【Results】 Through demonstration, it is determined that technological innovation development will inevitably have a significant impact on future publishing. With the development of technological innovation, especially the continuous innovation and widespread application of new-generation information technologies such as artificial intelligence, big data, and blockchain, future readers' reading interests and demands for content related to technological innovation development are increasingly strengthening, and the importance of science and technology-related publications is continuously increasing.

【Conclusion】 Future publishing models will be more scientific, with processes that are more streamlined, rational, and efficient. Publishing copyrights and intellectual property rights such as commercial patents will achieve automatic, instant approval, authorization, and linkage, and a unified linkage mechanism will be established between the two. Upon submission, one can apply for protection of creative achievements, preventing and reducing copyright risks during the stage from submission to public publication or release. Retraction mechanisms will be increasingly perfected, and a mechanism for repairing partial publishing content will be created. Most editorial and publishing personnel positions will

be replaced by artificial intelligence, and requirements for editorial staff will be increasingly elevated. Digital publishing copyright risks and challenges will be better addressed and managed.

Full Text

Preamble

ChinaXiv Cooperative Journal

Reflections on the Impact of Technological Innovation Development on Future Publishing

(People' s Publishing House, Beijing 100706)

Abstract

[**Purpose**] This paper aims to demonstrate the significant impact that technological innovation development will have on future publishing. [**Method**] Through analysis of eight dimensions—readers' interests and needs, the importance of publishing institutions, publishing models and workflows, unified coordination between publishing copyrights and commercial patents and other intellectual property rights, protection of creative achievements during submission, retraction mechanisms, requirements for editorial and publishing personnel, and digital publishing copyright risks and challenges—this study provides evidence with concrete examples. [**Results**] The analysis confirms that technological innovation development will undoubtedly exert major influence on future publishing. As technological innovation advances, particularly with the continuous development and widespread application of new-generation information technologies such as artificial intelligence, big data, and blockchain, readers' interest in and demand for content related to technological innovation will grow increasingly strong, and the importance of relevant scientific publications will continue to rise. [**Conclusion**] Future publishing models will become more scientific, with workflows that are more streamlined, rational, and efficient. Publishing copyrights will achieve automatic, instant approval, authorization, and linkage with commercial patents and other intellectual property rights, establishing a unified coordination mechanism between the two. Authors will be able to apply for protection of their creative achievements upon submission, preventing and reducing copyright risks between submission and public publication, retraction mechanisms will be increasingly perfected with partial content repair mechanisms created, most editorial and publishing positions will be replaced by artificial intelligence while requirements for editorial staff will rise, and digital publishing copyright risks and challenges will be better addressed and managed.

Keywords: technological innovation; reading interest; digital publishing; publishing model; copyright coordination
Classification Code: G239.2
Document Code: A
Article ID: 1671-0134(2023)05-043-04

DOI: 10.19483/j.cnki.11-4653/n.2023.05.009
Citation Format: Yang Ruiyong. Reflections on the Impact of Technological Innovation Development on Future Publishing [J]. China Media Technology, 2023(05): 43-46.

As scientific and technological innovation continues to develop, its boosting effect on all industries, including publishing, has become increasingly prominent, and readers' interest in and demand for content related to technological innovation have grown stronger. On one hand, readers are naturally curious about all innovative things and easily develop interest in them; on the other hand, most readers hope to enhance and reshape their own qualities by learning and mastering technological innovation knowledge, better equipping and developing themselves with technological innovation to stand out in competition. In fact, since the beginning of the 21st century, we can easily observe from the publishing market that books, newspapers, and magazines themed around technological innovation content—such as new-generation information technologies represented by artificial intelligence, quantum information, mobile communications, and the Internet of Things; life science fields represented by synthetic biology, gene editing, brain science, and regenerative medicine; advanced manufacturing technologies integrating robotics, digitalization, and new materials; energy technologies aimed at clean, efficient, and sustainable goals; and space and marine technologies—have been widely welcomed by readers. With further development of technological innovation, readers' interest in and demand for related content will undoubtedly continue to grow.

1. With Technological Innovation Development, Readers' Interest and Demand for Related Content Will Increasingly Strengthen

From a broad perspective or from a historical and global viewpoint, technological innovation has always played a significant, even critical, role in promoting economic, social, and military development. Especially since the First Industrial Revolution that began in the 1760s in Britain—a monumental revolution in technological history that initiated the era of machines replacing manual labor—the boosting effect of technological innovation on all industries, including publishing, has become even more pronounced. As the pace of technological innovation accelerates, the frequency of its renewal generally increases as well, which objectively further strengthens and amplifies the transformation benefits of technological innovation. This, in turn, further stimulates readers' interest in and demand for content related to technological innovation. Therefore, the faster the development of technological innovation, the more important scientific publishing institutions and publications become—an irreversible positive correlation trend.

2. With Technological Innovation Development, Scientific Publishing Institutions and Their Publications Will Become Increasingly Important

Science and technology constitute primary productive forces, and every progress in human society is often accompanied by advances in science and technology. Science and technology represent one of the important core drivers of social progress, and substantial improvements in social development levels are inseparable from scientific and technological advancement. Especially since entering the 21st century, various development "dividends" such as "cheap natural resource dividends," "cheap labor dividends," and "system and mechanism reform dividends" have been continuously diminishing or declining. Meanwhile, readers' growing interest in and demand for technological innovation content objectively reinforces the importance of scientific publishing institutions. Moreover, scientific publishing institutions are highly specialized, requiring editorial and proofreading staff with high professional qualifications, making them less substitutable among institutions. Combined with the increasingly strong demand for scientific talent, these factors contribute to the continuously rising importance of scientific publishing institutions.

In general, as the pace of technological innovation accelerates, the frequency of its renewal also increases, which objectively further strengthens and amplifies its transformation benefits. This further highlights the boosting effect of technological innovation on all industries, including publishing, and simultaneously stimulates readers' interest in and demand for related content. Consequently, the faster the development of technological innovation, the more important scientific publishing institutions and publications become—an irreversible trend. In fact, the accelerated renewal frequency of technological innovation and the strengthening of its transformation benefits will objectively drive scientific publishing review cycles to continuously shorten, better and faster satisfying readers' interests and needs, and promoting the faster realization of technological innovation transformation benefits. This will lead to continuously improving efficiency in scientific publishing, constantly enriched content and varieties, rising professional requirements for editorial and proofreading staff, fostering healthy industry competition, and ultimately benefiting the development of scientific publishing and enhancing its market share and benefits.

3. With Technological Innovation Development, Publishing Models Will Become More Scientific and Workflows More Streamlined, Rational, and Efficient

As technological innovation develops, particularly with the continuous innovation and widespread application of new-generation information technologies such as artificial intelligence, big data, and blockchain, more solid technical support and guarantees are provided for future publishing models to become more scientific and workflows more streamlined, rational, and efficient. For instance, in

the topic selection demonstration phase for publishers and the external expert review phase for journals, artificial intelligence and big data can automatically select review experts, automatically distribute, collect, summarize, and analyze topic application information and manuscripts, reducing or even eliminating the need for intermediate staff communication and coordination. This can essentially achieve zero time difference and zero delay in process operations, zero errors in workflow execution, significantly saving labor costs while greatly improving efficiency. Simultaneously, this approach is more fair and just, and can avoid corruption risks arising from personal connections.

In book and journal editing and proofreading, basic 校对规范流程 (proofreading standard procedures) will be directly handled by artificial intelligence in the future, with editorial and proofreading staff only playing a supporting role, substantially saving costs and improving efficiency. Books and journals can automatically conduct pre-market research through artificial intelligence and big data to more scientifically and accurately plan print quantities and reduce inventory. Distribution can achieve precise targeting, timely dynamic adjustment, and effective control through AI and big data, improving market distribution efficiency and economic benefits. Reader feedback on specific books, as well as feedback from related readerships, can be precisely collected through AI and big data, providing important references for more effective and targeted future work.

4. With Technological Innovation Development, Publishing Copyrights Will Achieve Automatic, Instant Approval, Authorization, and Linkage with Commercial Patents and Other Intellectual Property Rights, Establishing a Unified Coordination Mechanism

Some technological innovation achievements are based on fundamental theoretical research that may not immediately generate economic benefits, perhaps only producing value many years or even a long time in the future. Other achievements directly and instantly transform into real productive forces, generating substantial economic benefits. The latter often involve personal commercial patents, copyrights, and other intellectual property issues because they are directly related to personal economic interests. Generally, for technological innovation achievements that can directly and instantly generate economic benefits, there exists a contradiction between personal patent applications and public publication or release of research results. Consequently, most such achievements are not immediately published or released, and some may not be published even during the patent protection period, with publication occurring only after patent application. If personal research results are published first, they may leak commercial secrets and affect personal patent applications.

This situation is detrimental to the societal use and popularization of technological innovation achievements. To improve the efficiency of societal use and

popularization of these achievements in the future, public publication or release of technological innovation achievements will be automatically and instantly granted corresponding personal commercial patents. This means individuals will no longer need to apply for patents separately, substantially reducing overall social management and operational costs while achieving instant, automatic approval, authorization, and linkage between publishing copyrights and personal commercial patents and other intellectual property rights.

In the future, a unified coordination mechanism will be established between personal patent applications and public publication or release of research results, 打通两个通道 (opening up both channels) and resolving the contradictions between them. This will not only greatly reduce overall social management and operational costs but, more importantly, enable simultaneous public publication or release of personal patent applications and research results, making the popularization and application of societal technological innovation achievements more convenient and efficient, and better and faster transforming them into real productive forces to powerfully boost social and economic development.

5. With Technological Innovation Development, Submission Will Enable Application for Creative Achievement Protection, Preventing and Reducing Copyright Risks Between Submission and Publication, and Better Improving Societal Transformation Efficiency of Technological Innovation Achievements

For a considerable period, there has been a time gap between an author' s first submission and public publication or release, with some works undergoing multiple submissions before publication and others never being published. During this period, inherent risks exist for submitted creative achievements, including possible loss, leakage, theft, or infringement. To address these copyright risks at the submission stage, future copyright protection mechanisms can be created. Publishing institutions can establish databases of already published copyrights and submission copyright protection databases supported by technologies such as artificial intelligence and big data. This will both facilitate the transformation of technological innovation achievements and better protect authors' copyrights (including submission copyrights).

The submission copyright protection mechanism can be established as follows: when an author submits a work and it enters the publishing institution' s submission database, a submission copyright protection mechanism is immediately established, which subsequently leads to two scenarios. First, if the submission is accepted and subsequently published, the copyright is established and protected. Second, if the submission is not accepted, it remains in the submission copyright protection database, also in a state of copyright protection.

Unaccepted submissions remaining in the copyright protection database fall into

two categories. In the first case, if at some point similar research results (or substantially identical or similar main research) are published by other publishers or journals, and the submission time predates that publication, the submission automatically receives protection from the copyright protection mechanism and remains permanently in the database, having de facto obtained copyright protection. In the second case, if similar research results are published by others and the submission time is later than that publication, the submission cannot receive protection and must be removed from the database, with the system automatically returning it to the author and explaining the reason for rejection. However, both scenarios require full-process copyright protection for submissions, especially ensuring confidentiality when returning works to authors.

To realize such a submission copyright protection mechanism, a prerequisite is support from technological innovation achievements, particularly further development and application of AI and big data technologies capable of precisely screening and distinguishing commonalities or identities between submitted articles and already published articles with very high accuracy.

6. With Technological Innovation Development, Retraction Mechanisms Will Be Increasingly Perfected and Partial Content Self-Repair Mechanisms Created

Regardless of how far technology develops, human authors, as social subjects, will always have limited cognitive levels, with inevitable limitations and deficiencies, particularly in understanding and comprehending future innovative theories where gaps may always exist and errors may occur. Therefore, in the manuscript selection process, errors are inevitable even in the future, including possible knowledge-based mistakes. Additionally, while authors' research quality, personal integrity, and copyright awareness will continuously improve with social progress, issues such as piracy and plagiarism will remain unavoidable, and authors' research methods may also contain errors. For example, research sample representativeness, objectivity, and authenticity may have flaws, and manuscripts with false or fraudulent content may be accepted and published. When such issues are discovered and verified, retraction is generally the outcome. In the future, with further technological development, especially advances in AI and big data capable of automatically and rapidly identifying knowledge errors, piracy, plagiarism, and false content, retraction may no longer require manual (expert) verification and could be automatically processed by AI systems, with automatic notification to authors and follow-up work to mitigate impact.

For some published papers that are generally sound but contain minor defects, typos, non-standard expressions, or errors that do not affect main content, correction is generally not possible after formal publication (especially in print) and can only be addressed in revised editions. With future technological development, such errors can be automatically and quickly corrected through AI systems upon application by authors or publishing institutions.

7. With Technological Innovation Development, Most Editorial and Publishing Positions May Be Replaced by Artificial Intelligence, Requirements for Editorial Staff Will Rise, and Content Presentation Will Become More Streamlined and Environmentally Friendly

As technological innovation continues to advance, particularly with further development and widespread application of AI and big data, most positions in editing and publishing (except those related to original ideas, art, creativity, planning, and humanistic care) will be replaced by AI to varying degrees, partially or even completely. Current basic editing and proofreading tasks such as standard formatting, numbers, punctuation, footnotes, reference processing, typo correction, and general logical, knowledge-based, and habitual expression errors will be handled by AI in the future, achieving greater speed, accuracy, and efficiency than manual processing while substantially reducing costs.

While most positions are being replaced by AI, higher requirements will be placed on editorial and publishing personnel, particularly editors. The quality of academic dialogue between editors and authors will become a key factor in truly winning authors' respect and ultimately securing manuscript sources. Therefore, future editors must: first, engage in genuine academic dialogue with authors; second, truly understand readers and market needs; and third, continuously enrich their own professional theoretical research and original work achievements. These three capabilities will constitute the core competitiveness of future editors, with increasingly high demands for professional academic research, market analysis, topic planning, and integrated "editing-proofreading-creation" abilities.

Due to current academic evaluation mechanisms, academic works generally need to exceed 200,000 characters and academic papers need to be over 5,000-6,000 characters. This inevitably leads to excessive focus on word count and formal presentation, while the academic content and ideas themselves tend to be neglected or weakened. Many authors resort to "wearing hats and shoes"—padding their work with worthless verbiage and redundant content simply to meet word count requirements. This actually wastes limited social resources including authors' academic time, paper, and storage capacity. With social development, especially future technological innovation, society' s standards and requirements for environmental protection and resource conservation will rise, and authors will increasingly cherish their limited academic time. Consequently, future publishing content presentation will become more streamlined and environmentally friendly, with significantly compressed word counts as long as ideas can be accurately and completely expressed. For example, current academic works of over 200,000 characters may only need 100,000 or even just tens of thousands of characters in the future, and 5,000-6,000 character academic papers may only require 1,000-2,000 characters. As content presentation becomes more streamlined and environmentally friendly and academic time becomes more precious, readers' overall quality will simultaneously improve, leading to increasingly strict

demands on authors, editors, proofreaders, and publishers.

8. With Technological Innovation Development, Digital Publishing Copyright Risks and Challenges Will Be Better Addressed and Managed

Due to technological limitations, many digital publishing copyright risks currently cannot be eliminated and many challenges remain unaddressed, affecting digital publishing innovation and development and particularly constraining its marketization process. As technological innovation continues to advance, especially with further development and widespread application of AI, big data, blockchain, and digital currency (electronic money), future digital publishing copyright risks and challenges will be better addressed and managed. Particularly with digital currency technology, focusing on locking and tracing illegal copyright proceeds through technological means will enable better preventive measures. Future copyright violations will be permanently locked and traceable throughout one' s lifetime, illegal copyrighted works will be unable to be published or generate profit, large copyright gains or transactions will trigger automatic, instant, multiple reminders and warnings to copyright holders, and all digital copyright proceeds usage and flow will be automatically and permanently tracked and traced, shattering illusions of profiting from illegal copyrights and eliminating opportunities and space for violators.

However, while future technological innovation achievements can be used to better address digital publishing copyright risks and challenges, criminals can also utilize these same achievements for infringement and piracy. Technological innovation achievements are neutral—they can be used by good people to do good deeds and promote social and economic development and progress, but may also be used by bad people to do evil and hinder or even undermine social and economic development. Therefore, as future technological innovation continues to advance, we must take preventive measures and be prepared, anticipating and creating relevant systems and mechanisms to prevent criminals from using technological innovation achievements for malicious purposes.

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Note: Figure translations are in progress. See original paper for figures.